

XI International Eurasian Educational Research Congress

CONFERENCE PROCEEDINGS



XI INTERNATIONAL EURASIAN
EDUCATIONAL RESEARCH CONGRESS

EJERCONGRESS 2024
CONFERENCE
PROCEEDINGS

May 21-24, 2024/ Kocaeli University - Türkiye

Editor

Distinguished Professor Şenel POYRAZLI,
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Main Theme

“Designing the Future: Changing Paradigms and Transhumanism with Artificial Intelligence in Education”

Sub-Themes

- Academic freedom, autonomy, and social responsibility in education
- Artificial intelligence and educational applications
- Augmented reality applications
- Barriers to learning
- Blended learning
- Computer-assisted measurement and evaluation
- Core skill sets for students and teachers
- Design of school buildings in the future
- Designing and delivering a digital strategy
- Digital competence
- Digital parenting
- Distance Education
- Earthquake Education
- Post Earthquake Trauma Training
- Earthquake and Effective Psychosocial Intervention Methods
- Earthquake and Trauma
- The Impact of Earthquakes on School Staff
- Education and society
- Education for healthy living and healthy communities
- Education for a sustainable life
- Education in the digital age: Primary, secondary, high school, higher education, and application examples
- Educational leadership in the digital age
- Effects of regional differences on education
- Equity, Diversity, and Inclusion Related to Marginalized Groups
- Emergency Management at Schools
- Evidence-Based School Counseling Services for Refugees and Marginalized Groups
- Globalisation and Education
- Higher education
- Innovative learning designs for student success
- Instructional technologies in the digital age
- Integration of immigrants into education
- K-12 education (preschool, primary, and secondary education)
- Learning management systems
- Lifelong learning
- Machine learning
- Management information system
- Managing schools
- Measurement and evaluation of students’ learning outcomes
- Metaverse
- Migration and education
- Multicultural Classroom Concerns of Educators and Parents
- New educational system after COVID-19
- New skills to live and work in new times
- New technologies in teaching and learning

- New trends in educational research
- New trends in learning and teaching methods
- New trends in research methods
- Pedagogy, educational programs, and teaching
- Politics, good governance, and leadership in the educational sector
- Program design and development
- Promoting equality, diversity, and inclusion
- Psychological counseling and guidance in education
- Quality assurance/standards and accreditation
- Research and innovations in education
- Research ethics
- Right to an education
- Sustainable Educational Goals Related to Refugees
- Teacher education in the digital age
- The Possibility of Fundamental Changes in the Curriculum
- The role of parents in education
- The skills we need to thrive in a post-COVID-19 world
- Vocational education
- Ways to overcome the digital divide

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Abstract

This study investigated how history education can be transferred to the virtual world in line with aesthetic and reality concerns through computer-aided design programs and how this transfer can contribute to the instructiveness of historical science. The study hypothesized that advanced technologies enable more effective visualization of historical events and places and that historical knowledge transferred to the virtual environment makes the use of past knowledge more accessible and interactive in future educational approaches. In the study, historical and formal analysis methods from qualitative research methods were used. In the first stage, a literature review was conducted and geographical and period characteristics were used as data in the design phase. In the second stage, historical information was transferred to the digital environment and presented using gamification and interaction techniques. The theoretical basis of the study; It is supported by the Digital Game-Based Learning Theory proposed by Zin, Jaafar, and Yue and Richard E. Mayer's Media and Learning Theory. The findings of the study reveal that it is possible to revitalize historical science in the digital environment thanks to technological developments and computer-aided programs and that this method can make significant contributions to the field of education. The contributions and advantages of digital methods over traditional methods were evaluated, and as a result of the study, it was seen that history and technology work in an interdisciplinary, effective and integrated manner. This research offers a unique contribution to history education with its interactive and game-based structure. The application model designed within the scope of this study was experienced by 28 students. As a result of the findings obtained from the survey, it was determined that game-based learning and virtual environment models have a positive contribution to history education.

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Keywords: Digital game-based learning, Virtual history education, Computer-aided design, Interactive learning, Historical visualization

Introduction

Computer-aided design programs and digital technologies have brought significant changes and innovations in the field of education. Many disciplines have been greatly affected by these technological developments. Historical science is one of the fields affected by these innovations. While traditional history teaching methods are generally limited to text-oriented and limited interactive materials (Önal, 2021: 321-322); the opportunities offered by the digital age enable historical information to be presented in a more interactive, accessible and visually rich way. In this context; Digital game-based learning methods and virtual environments enable the reshaping of history education. However, it is still unclear how these technologies can be used in history education and how this use can contribute to the teaching of historical science. The main purpose of this study is to examine how history education can be transferred to the virtual world through computer-aided design programs and the contributions of this transfer to the instructiveness of historical science. For this purpose, the basic research questions to be asked within the conceptual framework are:

Q1. How can history education be transferred to the virtual world through computer-aided programs?

Q2. What design and technology methods can be used for historical information transferred to the virtual environment?

Q3. Are these methods a suitable approach to use knowledge of the past when designing the future?

These questions were determined to evaluate the effectiveness of digital game-based learning methods in history education and to investigate the integration of these technologies into educational processes. In this context, the research aims to discuss how history education can be presented more effectively in virtual environments, the suitability of the design and technology methods used, and the contributions of these approaches to educational processes.

Digital Technologies and Game Design in Education

The rapid advancement of technology and the devices obtained have taken production to very different levels. Education, one of the disciplines that progresses with traditional methods, has been affected by this change and has integrated technology and digital into its education methods. Game design and gamification method is also one of the methods used. Game design provides children and young people with the opportunity to learn and apply skills and knowledge (Yıldırım, 2016, p. 12). Data obtained from different studies have shown that classical teaching methods and techniques are inadequate in the education received by today's students, called digital natives. (Savaş, Güler, Kaya,

Çoban, & Güzel, 2021, p. 117). In this context, it can be said that the field of education is in search of a place and exhibits interdisciplinary work.

Research evidence now shows that people's thinking is shaped by personal experiences (Council & Mesoudi, 2021). Social networks and digital technologies are the environments where the new generation of students, who are considered digital natives, gain and shape these experiences. In this context, digital natives demand that their education and materials be as accessible and active as social networks. (Savaş, Güler, Kaya, Çoban, & Güzel, 2021, p. 119). The interaction of education is of great importance at this point. Therefore, educational methods that will both provide interaction in education and training and attract students' attention should be preferred. One way to prepare educational environments that will provide active learning and increase success is through digital games. (Yıldırım, 2016, p. 13). Digital games and the methods used also provide the opportunity to simulate virtual environments and classrooms.

Oblinger explains the reasons why games make learning stronger in five points as follows; (a) the fact that games are multi-sensory, active, experimental and problem-based, (b) the fact that games require them to use their previous knowledge to progress, (c) they provide rapid feedback by allowing players to learn from their work and make assumptions, (d) the fact that they provide rapid feedback to different levels. Providing players with the opportunity for personal evaluation by coming and scoring, (e) creating a social environment that includes player communities (Oblinger, 2004). In this context, it can also be said that gamification makes learning practical.

Method

This study has a four-stage research design designed to evaluate the effects of digital technologies on history education. Method of the research; It includes historical and formal analysis, digital media design, gamification techniques and user evaluation processes.

Research Design

Historical and Formal Analysis

The first phase involved a comprehensive review of the existing literature on how history education can be delivered in a digital environment, based on a qualitative research design. In this phase, data on historical events and places were analyzed using historical and formal analysis methods. The literature review provided basic information on how historical information can be integrated into digital design and the aesthetic and reality dimensions of historical data were evaluated.

Digitalization

The second phase includes a design and implementation process to transfer historical information to the digital environment and determine how this information will be

presented in the virtual environment. In this process, computer-aided design programs and virtual environment tools were used. Gamification and interaction techniques have been applied to investigate how historical information can be presented more effectively in virtual environments.

Learning Theories

The theoretical framework of the study is the Digital Game-Based Learning Theory proposed by Zin, Jaafar and Yue. This approach; It is a game development process that includes analysis, design, development, quality assurance, application and evaluation stages in the learning process of games. (Savaş, Güler, Kaya, Çoban, & Güzel, 2021, p. 119). Another approach, Mayer's theory, states that digital games support multi-sensory learning by combining text, images, videos and simulations and how interactive content improves the learning process (Mayer, 2001: 49-50). In this context, these two theories support the study.

User Evaluation

In the final stage of the research, the effectiveness of historical information presented in a digital environment was evaluated. User feedback, interaction analysis and learning results were collected and analyzed. This evaluation process was carried out to determine the contributions of the methods and designs used to the education and training processes. A survey study was prepared for user feedback and the designed model was experienced. This research design was designed to comprehensively evaluate how history education can be presented more effectively in the digital environment and the challenges and successes encountered in this process. While doing this, an attempt was made to integrate digital design methods with educational methodology. The draft aims to contribute to the teaching of history education.

Findings

At this stage of the study, the research questions were explained one by one. Research questions were answered especially through application studies. The visuals included in the study were discussed and developed within the scope of this study.

Table 1: Study Method (Özge KAYA- Kader SÜRMEİ)

A1. History education passes through certain stages while moving to the virtual world through computer-aided programs.

Concept	Two-Dimensional Drawing	Three Dimensional Modeling	Space Design	Interaction
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As can be seen in Table 1, the study first started with a concept definition. The concept design was predominantly determined as the Aegean region in antiquity. The Aegean region in antiquity was interpreted through coins with the contributions of ancient numismatics.

Image 1

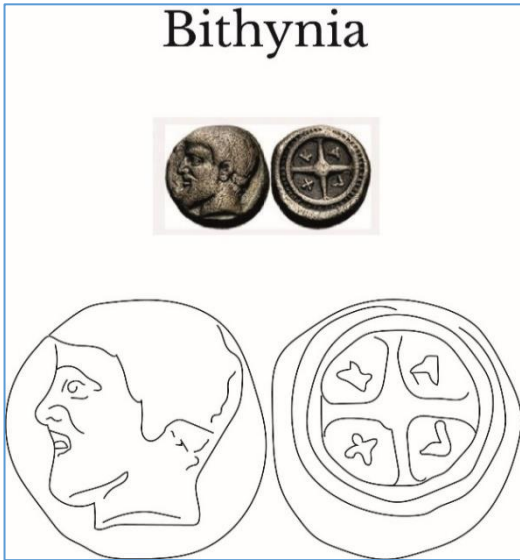
Concept (Özge KAYA- Kader Sürmeli)



After the concept design, two-dimensional drawings of the determined coins were made with the Photoshop program. The drawn coins were then printed as PNG and added to the ancient ruins in the Unreal Engine game engine. Visual 2 shows a drawing of an ancient coin from the Bithynia region.

Image 2

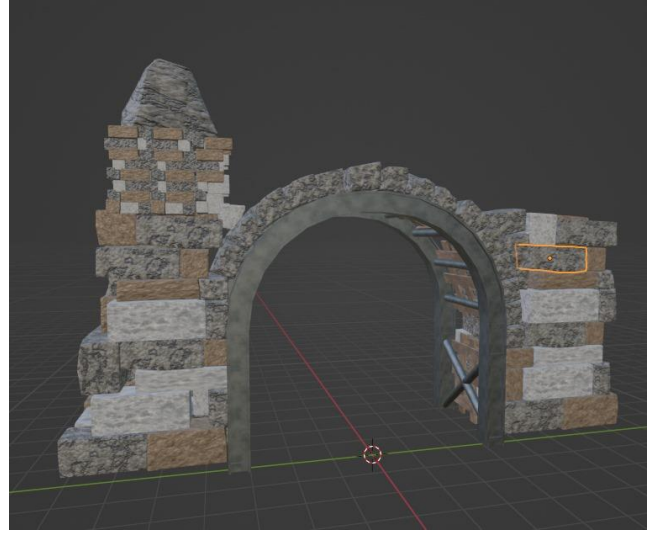
Photoshop Sample Drawing (Drawing: Özge KAYA)



In the project, which was carried out specifically in the Aegean region of Anatolia, the ancient cities and finds of the relevant regions were examined. The selected ancient material was modeled in three dimensions in the Blender program. While modeling, care was taken to remain as faithful to the original as possible, especially in the texture phase, and to not age the model.

Image 3

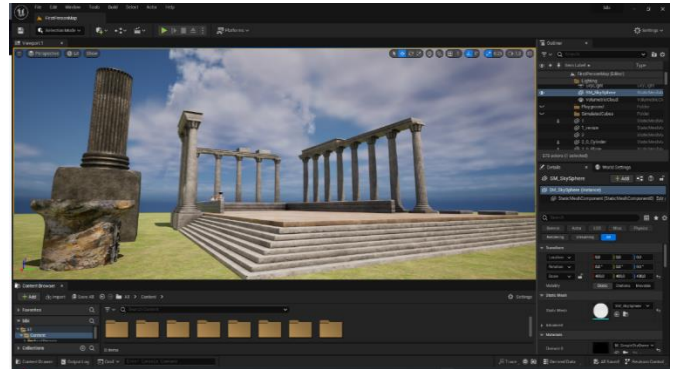
Three-Dimensional Modeling of the Ancient City with Blender (Modelling: Özge KAYA)



Since the study was conducted within the scope of ancient numismatics, ancient cities were utilized in space design. Ancient coin motifs prepared digitally were exhibited in a virtual space with 3D modeling and design. In this virtual space supported by lighting, shading and atmospheric effects, it was tried to keep the atmosphere and magic of the ancient period alive. Geographical location was taken into consideration and appropriate environmental design was made for the region.

Image 4

Euromos Ancient City (Modelling: Özge KAYA)



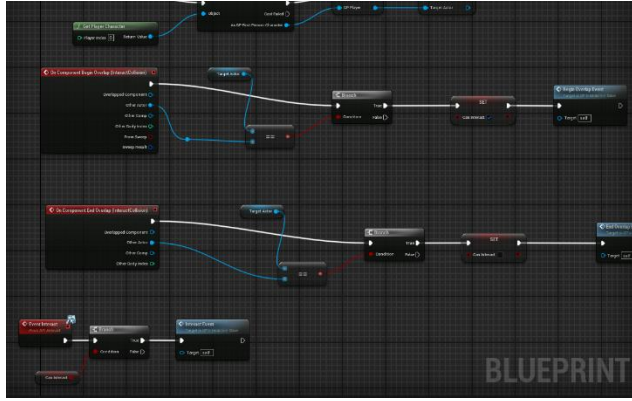
Euromos Ancient City was used as the main location for the study. Euromos Ancient City is one of the best preserved ancient cities in Western Anatolia. The ancient city is located in Muğla province. Geographically, it is in close political and cultural relations with its closest neighbors Khalketor, Olypmos, Mylasa, Iasos, Pidas, Herakleia and Miletos. The eastern, northeastern and southeastern sides of the city are surrounded by not very high mountains and hills forming the southern extension of the Latmos Mountains. In front of it lies a wide plain with rich alluvial soils suitable for agriculture. The city spreads towards the plain from the foothills of Kızılbayır

Mountain in the east. This positioning is planning seen in most of the ancient settlements (Kızıl, 2023: 1). Since our study mostly covers the Western Anatolia Region, the space design is based on the Ancient City of Euromos.

A2. The transfer of historical information to the virtual environment has been realized using various design and technology methods. Firstly, interactive design methods were studied. The reason for this is to enable users to explore historical information in an interactive way. In this context, an interactive map was created. The interaction structure of the map was designed to provide a user-oriented experience.

Image 5

Interaction Codes

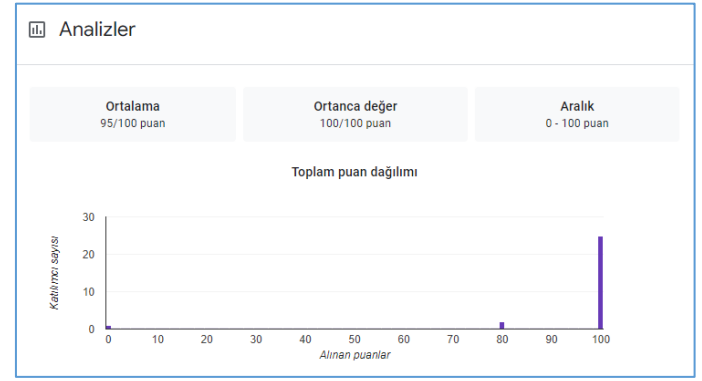


Another element that affects the design phase is storytelling. In order to effectively present historical information, organizing the scenario and content structure enriches the narration by using visual and audio elements. 3D modeling and animation methods enable historical places, objects and events to be presented in detail in a virtual environment.

A3. These methods are a very suitable approach to use the knowledge of the past when designing the future. Presenting historical information in the virtual environment has facilitated the understanding of the past and the integration of this information into future designs. While interactive design technologies allow users to experience historical events and spaces dynamically; 3D modeling and animation provide detailed visualization of the past. However, these data were also confirmed by a user-based survey study. Table 2 shows the results of the survey conducted on students. According to the survey results, it was determined that history can be learned through digital game-based methods.

Table 2

Survey Results



Conclusion

This study started by analyzing the motifs and symbols on coins within the scope of ancient numismatics. The symbols on the coins were drawn as sketches and then the drawings were made in the Photoshop program. The coins were examined and the regions were analyzed geographically. The ancient cities and their findings in the relevant regions were examined and the suitable ones were modeled in three dimensions with the blender program. While modeling, attention was paid as much as possible to the soil structure and color of the region and how intact it has survived to the present day. As the models were made, they were thrown into the Unreal Engine game engine and a specific virtual space was created. When all the models were completed, an environmental design was made, taking into account the geography and region, especially the climate and vegetation. Finally, the drawn coin motifs were pasted in the appropriate places on the models. As a result of the study, the motifs on ancient coins were presented within the ancient ruins and space. In the following stages, an interaction was made by providing narration through voice. In this study prototype aims to provide versatile and effective history learning.

The study evaluated the aesthetic and reality dimensions of transferring history education to the virtual world by using computer-aided design programs. The research presented findings that support the accuracy of their hypotheses. First, it was concluded that advanced technologies enable more effective visualization of historical events and places. Computer-aided design tools have supported users' better understanding and concepts of historical contexts by allowing historical information to be presented in a detailed and impressive manner. Secondly, it has been observed that historical information transferred to the virtual environment makes the use of historical information in education more accessible and interactive. It is thought that digital game-based learning methods will allow students to learn historical information in a more in-depth and interactive way and will encourage students' active participation in the learning processes with gamification and interaction techniques. As a final result, it was concluded that the integration of history education with technology has a significant potential in the field of education and innovations in this field should be continued. This research has attempted to provide valuable

information on how technological innovations can be effectively integrated with the field of history education and to provide a fundamental reference point for future research.

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